

**What is claimed is:**

1           1. A freely rotatable micromechanical plate apparatus, comprising:  
2           at least three rotatable plates, each of said rotatable plates being suspended from a  
3 substrate via a respective first spring;  
4           a moveable plate;  
5           at least three moveable plate attachment points, each of said moveable plate  
6 attachment points being coupled to a respective one of said rotatable plates via respective  
7 ones of second springs so that rotation of each of said rotatable plates about a respective  
8 axis transfers motion to the moveable plate attachment points; and  
9           at least three posts, each of said posts coupling the movement of each of a  
10 respective one of said moveable plate attachment points to said moveable plate.

1           2. The invention as defined in claim 1 wherein said moveable plate is a mirror.

1           3. The invention as defined in claim 1 wherein said springs are deformable elastic  
2 elements.

1           4. The invention as defined in claim 1 wherein at least one of said springs is a  
2 relatively thin beam.

1           5. The invention as defined in claim 1 wherein at least one of said springs is a  
2 folded set of beams.

1           6. The invention as defined in claim 1 wherein at least one of said first springs is  
2 located along an edge of its associated rotatable plate and acts as the axis of rotation  
3 therefore.

1           7. The invention as defined in claim 1 further comprising at least one electrode  
2 located below at least on of said rotatable plates.

1           8. The invention as defined in claim 1 further comprising an additional plate, said  
2 additional plate being coupled to at least one of said rotatable plates and being adapted to  
3 rotate said rotatable plate.

1           9. The invention as defined in claim 8 wherein said additional plate is coupled to  
2 said rotatable plate by at least one spring.

1           10. The invention as defined in claim 8 wherein said additional plate is adapted  
2 to rotate said rotatable plate using angle amplification.

1           11. The invention as defined in claim 8 further comprising at least one electrode  
2 operable to move said additional plate.

1           12. The invention as defined in claim 8 further comprising at least a comb drive  
2 operable to move said additional plate.

1           13. The invention as defined in claim 1 wherein at least one of said rotatable  
2 plates incorporates fingers that are part of a comb drive.

1           14. The invention as defined in claim 1 wherein at least one of said rotatable  
2 plates is a vestigial rotatable plate.

1           15. A method for making a freely rotatable micromechanical plate apparatus,  
2 comprising:  
3           suspending from a substrate via a respective one of a first set of springs each of at  
4 least three rotatable plates;  
5           coupling each of at least three moveable plate attachment points to a respective  
6 one of said rotatable plates via respective ones of a second set springs so that rotation of  
7 each of said rotatable plates about a respective axis transfers motion to the moveable plate  
8 attachment points; and

- 9           coupling a moveable plate to each of said moveable plate attachment points via a  
10   respective one of least three posts, each of said posts coupling the movement of each of a  
11   respective one of said moveable plate attachment points to said moveable plate.